53782

Midlands Environmental Consultants, Inc.

November 30, 2016

Mr. John C. Bryant, Hydrogeologist
Corrective Action Section
South Carolina Department of Health
and Environmental Control
Bureau of Underground Storage Tank Management
2600 Bull Street
Columbia, South Carolina 29201

Subject: Corrective Action Plan
Island Car Wash
1008 William Hilton Parkway
Hilton Head Island, South Carolina
SCDHEC Site ID# 00990

Dear Mr. Bryant,

Midlands Environmental Consultants, Inc. (MECI) is pleased to submit the attached Corrective Action Plan (CAP) for the referenced site. This plan describes our proposed approach for site rehabilitative measures in general accordance with South Carolina Department of Health and Environmental Control (SCDHEC) guidelines.

Midlands Environmental appreciates the opportunity to offer our professional environmental related services to you on this project. Please feel free to contact us at 803-808-2043 if you have any immediate questions or comments.

Sincerely,
Midlands Environmental Consultants, Inc.

Kyle V. Pudney
Project Biologist

Bryan T. Shane, P.G.
Principal Geologist

Post Office Box 854, Lexington SC 29071 • 231 Dooley Road, Lexington, SC 29073
Telephone: (803) 808-2043 • fax: (803) 808-2048

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1.0 PROJECT INFORMATION

The subject site (Island Car Wash) is located at 1008 William Hilton Parkway in Hilton Head, Beaufort County, South Carolina. The subject site formerly maintained three 10,000 gallon gasoline underground storage tanks (UST's) and one 10,000 gallon diesel UST. The subject UST's were abandoned by removal from the ground in October of 2005. The South Carolina Department of Health and Environmental Control (SCDHEC) reported a release of petroleum product in December of 2005 and confirmed the release in January of 2006. The subject site is currently ranked a Class 2BB.

The above information is based on reports and correspondence obtained from SCDHEC files and MECI field notes.

2.0 ASSESSMENT SUMMARY

Based on the results from previous assessment activities, it appears that ground water (Figure 4/4A) at the subject site has been impacted by petroleum constituents. The highest concentrations of dissolved phase contaminants appear to be located on the southwestern portion of the property in the area of RW-2, RW-4, and MW-3R. The contaminants appear to be gasoline range constituents. Groundwater elevation data reveals the groundwater flow from the release is currently semi-radial. This could be a result of coastal processes.

3.0 SITE REMEDIAL GOALS

SCDHEC has outlined site rehabilitative goals and Site Specific Target Levels (SSTLs) for dissolved phase CoC's for five groundwater monitoring wells:

MW#		Toluene	Ethylbenzene	Xylenes	Naphthalene
MW-3R	Subsequent	1,900	2,000	9,400	*400*
	SSTL	4,844	7,534	211,992	*149*
	Subsequent>SSTL	0	0	0	*251*
RW-1	Subsequent	50	450	1,800	130
	SSTL	10,449	23,661	915,949	355
	Subsequent>SSTL	0	0	0	0
RW-2	Subsequent	3,900	4,500	25,000	*740*
	SSTL	10,449	23,661	915,949	*355*
	Subsequent>SSTL	0	0	0	*385*
RW-3	Subsequent	360	380	1,400	*160*
	SSTL	4,619	7,017	193,551	*141*
	Subsequent>SSTL	0	0	0	*19*
RW-4	Subsequent	910	2,200	10,000	*460*
	SSTL	8,208	16,528	579,113	*270*
	Subsequent>SSTL	0	0	0	*190*

Based on the most recent analytical data (September 28, 2016), monitoring well MW-3R and recovery wells RW-2, RW-3, and RW-4 currently contain dissolved CoC's greater than the established SSTLs. Naphthalene concentrations in recovery well RW-1 are also above the Risk Based Screening Levels (RBSL's).

4.0 PROPOSED REMEDIAL APPROACH

MECI proposes a rehabilitative approach composed of the direct injection of a pulverized activated carbon based product into the areas surrounding the recovery wells and monitoring well MW-3R to

reduce concentrations of petroleum hydrocarbons. Following the proposed injection activities, a 45 day stabilization period will ensue to allow for absorption of petroleum based contaminants to occur. Once stabilization has been met, three 96-hour Aggressive Fluid Vapor Recovery Events will be performed on wells RW-2, RW-4, and MW-3R to dewater the aquifer, remove contaminated groundwater, and to better spread injectant through the vadose zone.

The conceptual design of the proposed remediation system was developed based on our knowledge of existing site conditions, our knowledge of the remediation equipment recommended, and recognized success utilizing this technology at other sites with similar lithology. The individual components of the remediation procedure are outlined in the following sections.

Several remedial alternatives were evaluated to restore impacted soil and groundwater to SCDHEC prescribed concentrations. Constraints and limitations that affect site restoration include the types of contaminants, surface and subsurface site characteristics, concentration of subsurface utilities, and aboveground site utilization. The objective of any remedial evaluation is to present the most appropriate strategy for the subject site.

Injection of a pulverized carbon product into the specified areas of the contaminant plume will allow the carbon to absorb petroleum based contaminants, as well as provide a substrate for indigenous bacteria to colonize and regenerate the carbon *in-situ*. Injection at several different depths will allow for treatment of dissolved CoC's in the groundwater to address the downward and/or off-site migration of contaminants, and treatment of the vadose zone to prevent contamination rebound due to infiltration and season water table fluctuations. Injections of this type can have a radius of influence of between 3 to 20 feet, depending on soil conditions at the subject site. For design purposes, the radius of influence for each injection point is estimated at 20 feet.

Pilot studies conducted by the technology manufacturer indicate that in some cases, a single application of pulverized carbon provides significant reductions in contaminant concentrations within a relatively short time-frame (days to weeks). Some sites may required multiple applications or require longer periods of time before adequate reductions in contaminant concentrations are observed. In all cases, the reduction in contaminants will be affected by further releases, unidentified sources and ongoing influences to the injection area by surrounding contaminant plumes.

5.0 DESIGN AND OPERATION PROPOSED REMEDIAL APPROACH

The proposed injection event will be conducted in the vicinity of the recovery wells and monitoring well MW-3R. Sampling events will be conducted approximately 45 days following the final proposed AFVR event. This sampling event will determine the effectiveness of the proposed injection and AFVR events.

The proposed corrective action plan includes the injection of pulverized activated carbon into the contaminant plume, followed by supplemental AFVR events. The details of the remedial system are provided below.

5.1 DIRECT INJECTION

MECI proposes to inject a total of 2,000 pounds of pulverized activated carbon and 2,000 gallons of potable water (18,000 lbs. of slurry) into the desired smear zone. In each injection location, potable water will be mixed with the appropriated quantity of product and injected at 5 foot intervals using depth sets between 5, 10 and 15 feet below ground surface (BGS). Figure 6 shows the approximate

location of the area where MECI proposes forty (40) direct injection points. A direct-push drilling rig, operated by a SC certified well driller, will be used to install the injection points. Injection rods will be pushed to the desired interval, the appropriate amount of pulverized activated carbon mixed with potable water will be injected, the rods will be pushed an additional five feet, and the process will continue to the termination depth. Flow rates will be adjusted to between 2 gallons per minute (gpm) and 10 gpm with average injection pressures between 10 pounds per square inch gauge (psig) and 60 psig. Injection pressures will not exceed 80 psig. Injections for the injection event should take between 3 and 5 days depending on site conditions.

During the injection event, should the product surface or enter monitoring wells, it will be removed using vacuum extraction. Once the injection process is complete the potential for surfacing of the product is eliminated.

5.2 AGGRESSIVE FLUID VAPOR RECOVERY EVENTS

Following a proposed 45 day injectant stabilization period, MECI proposes to conduct AFVR events to remove reduce dissolved petroleum compounds from the "smear zone" at the subject site. MECI's multi-phase extraction units will perform dual phase extraction to remove hydrocarbons (liquid and vapor phase) from wells RW-2, RW-4, and MW-3R at the subject site. MECI's AFVR units employ a combination of specially designed trailer-mounted vacuum and liquid handling knock out tank integrated with a vapor phase activated carbon unit. A vacuum is applied to multiple wells with a down hole apparatus (drop-tube) used to control the fluid elevation in each extraction well. During the event, the vacuum forcefully induces free phase petroleum product, contaminated groundwater, and vapor into the extraction wells from both the vadose zone above the water table and the saturated zone below simultaneously.

MECI's mobile extraction units are a trailer-mounted systems equipped with 40 kw (kilowatt) diesel Generator Sets which powers a 20 HP (horsepower) VMAX oil-sealed vacuum pump system (Model VMX0303K) which is capable of providing an air flow of 250 CFM (Cubic Feet per Minute) at 25 inches of Mercury, and a 2 HP Moyno 500 Series (Model 3913670100) transfer pump to off load fluids produced (see Figure 3). A mounted 480 Volt/3 Phase electrical control panel operates both the Vacuum pump system and the transfer pump. Prior to start-up of the AFVR event, a stinger (drop-tube) is inserted into the well and installed approximately 6 inches below the bottom of the product layer. A 2.5 inch Petroleum Flexwing hose is connected to both the well head connection and the trailer-mounted manifold which is connected to the fluid holding tank. Once start-up has commenced vapor phase volatile organic compounds (VOC's) are routed from the vacuum pump system to a vapor phase granular activated carbon vessel which filters the off-gas before discharging into the atmosphere.

6.0 SITE MONITORING AND SYSTEM EVALUATION

The effectiveness of the proposed remediation approach will be evaluated through groundwater sampling results.

The entire monitoring well network will be sampled approximately 45 days following the completion of proposed AFVR events. The wells will be sampled in accordance with SCDHEC's most recent Quality Assurance Program Plan for the Underground Storage Tank Management Division and MECI's most recent Standard Operating Procedures. Groundwater samples obtained will be analyzed for BTEX, Naphthalene, MtBE, 1,2-DCA, and 8-Oxygenates (EPA Method 8260-B).

The follow table presents an approximate timetable for corrective action activities:

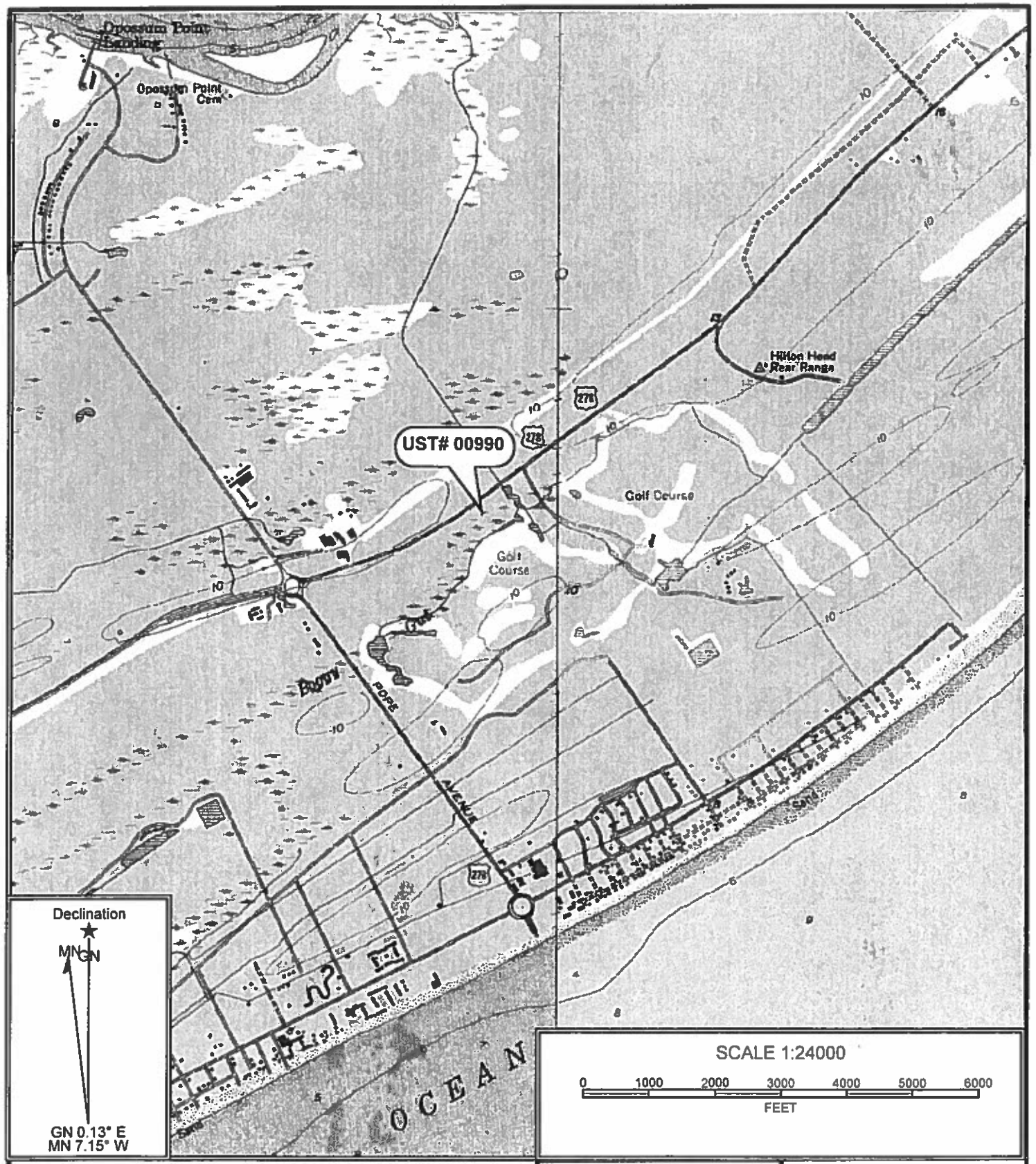
Item	Start Date	End Date	Comments
CAP Preparation	11/30/2016	12/1/2016	Completed
CAP Approval	12/1/2016	TBD (1/1/2017)	Awaiting Approval
CAP Implementation	1/1/2017	2/1/2017	Dependant upon approval
PAC Stabilization	2/1/2016	2/1/2017	Dependant upon injection completion
AFVR Event #1	3/20/2017	3/24/2017	Dependant upon injection completion
AFVR Event #2	3/27/2017	3/31/2017	Dependant upon injection completion
AFVR Event #3	4/3/2017	4/7/2017	Dependant upon injection completion
Groundwater Sampling	5/22/2017	6/13/2017	Dependant upon AFVR completion
Final Report Issued	6/13/2017	7/4/2017	Dependant upon sampling completion

7.0 QUALIFICATIONS OF REPORT

The activities and evaluative approaches used in this remediation proposal are consistent with those normally employed in hydrogeological remediation and waste management projects of this type. Our evaluation of site conditions has been based on our understanding of the site, project information provided to us, and data obtained in our exploration. The general subsurface conditions utilized in our evaluation have been based on interpretation of subsurface data between borings.

-oOo-

FIGURES



Reference: Bluffton, South Carolina
USGS 7.5 Min. Quad
Contour Interval– 10 Feet

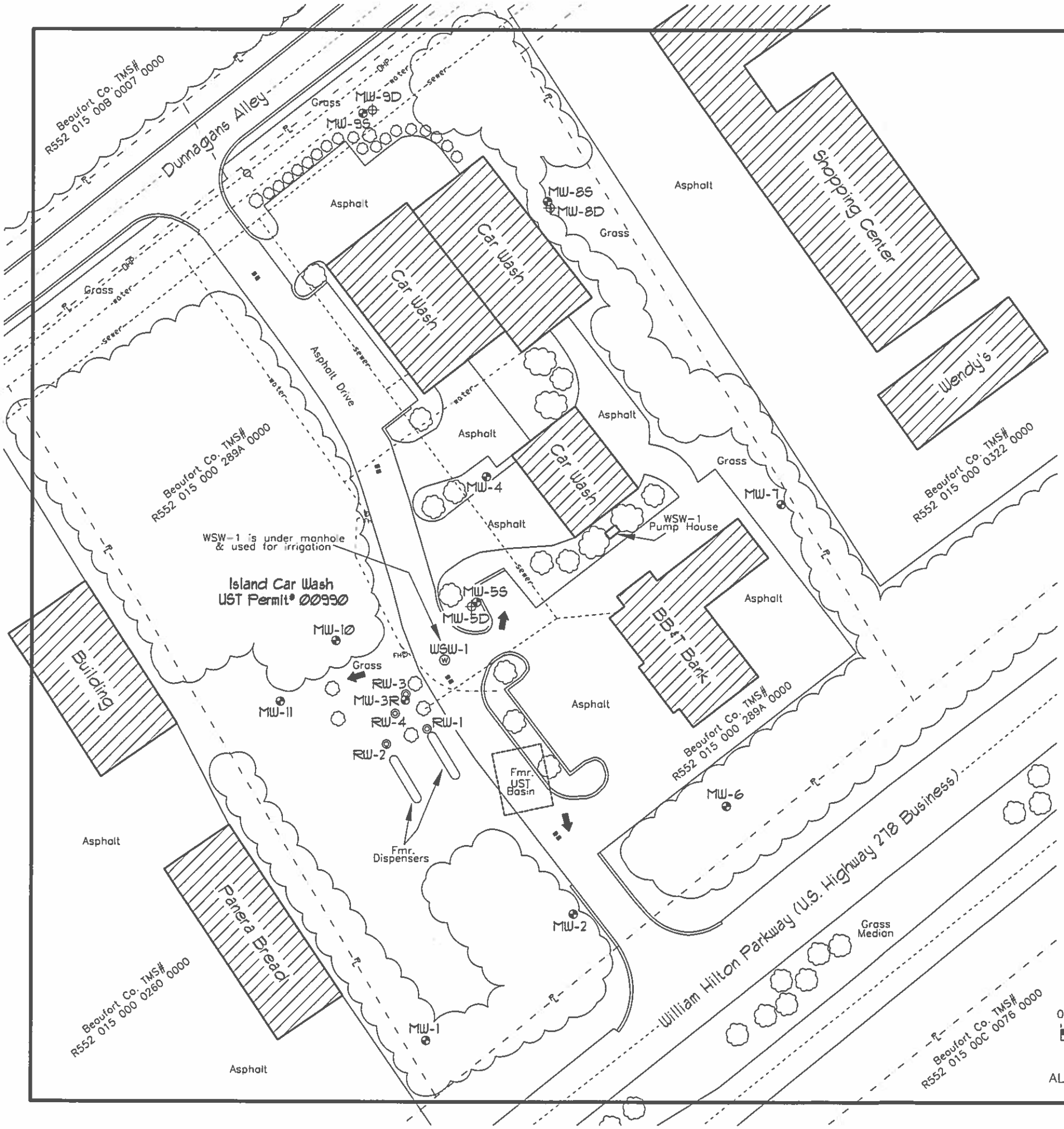
Midlands Environmental Consultants, Inc.

Site Location

Island Car Wash
1008 William Hilton Parkway, Hilton Head, SC
SCDHEC Site ID# 00990

Figure 1

MECI 15-5734



Explanation:

- Location of Watertable Bracketing Monitoring Well
- Location of Double Cased "Deep" Monitoring Well
- Location of 4-Inch Recovery Well
- Location of Water Supply Well
- Estimated Location of Removed Underground Storage Tanks
- Storm Sewer Drop Inlet

---OHP---Overhead Powerline

- -R- -Property Line

---water---Buried Water Line

---sewer---Buried Sewer

GRAPHIC SCALE

0 30 60 90 120

1IN = 60FT

ALL LOCATIONS ARE APPROXIMATE

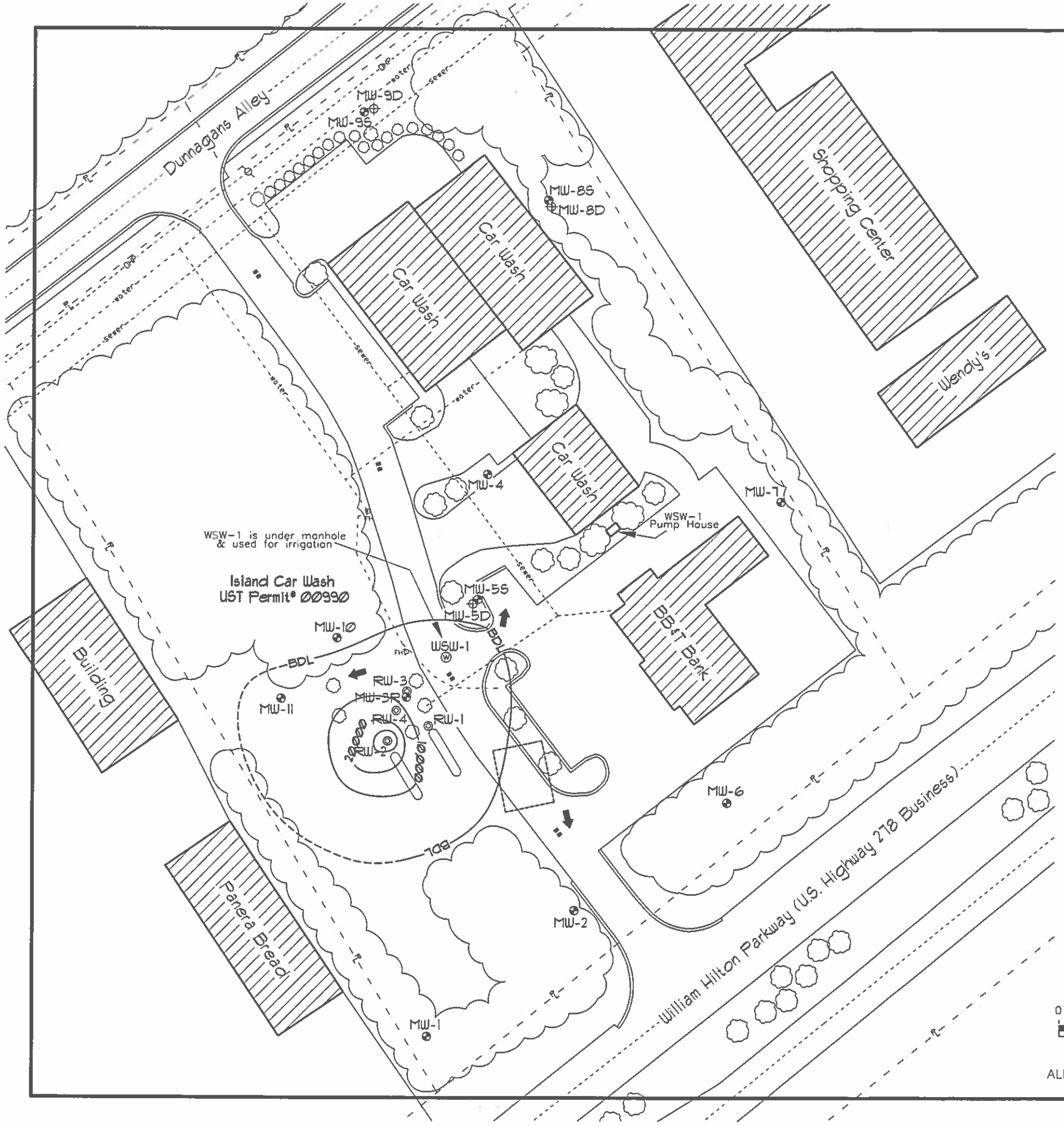
Drawing Based on MECI Field Notes, Tax Maps, SCDHEC Files and a RLS Survey of the Site by Jay S. Joshi dated April 1, 2015.

Site Base Map

Island Car Wash
1008 William Hilton Parkway
Hilton Head Island, South Carolina
SCDHEC Site ID 00990

Midlands Environmental Consultants, Inc.

JOB NO. 16-5734
DATE October 10, 2016
FIGURE 2



Explanation:

- Location of Watertable Bracketing Monitoring Well
- Location of Water Supply Well
- Location of Double Cased "Deep" Monitoring Well
- Estimated Location of Removed Underground Storage Tanks
- Location of 4-Inch Recovery Well
- Storm Sewer Drop Inlet
- Total BTEX Concentration Isopleth (ug/l)

Groundwater COC Concentration Data

Sample #	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)	Total BTEX (ug/l)	Naphthalene (ug/l)	MTBE (ug/l)	12 DCA (ug/l)	EDB (ug/l)
MW-1	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-2	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.020
MW-3R	<250	1,900	2,000	9,400	13,300	400	<250	<250	<0.019
MW-4	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.020
MW-5s	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.020
MW-5D	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	51	<5.0	<0.020
MW-6	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.020
MW-7	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.020
MW-8s	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.021
MW-8D	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.021
MW-9s	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.021
MW-9D	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	2.4J	<5.0	<0.021
MW-10	<5.0	<5.0	<5.0	<5.0	BDL	1.2J	<5.0	<5.0	<0.020
MW-11	<5.0	1.1J	62	24	87.1J	19	<5.0	<5.0	<0.021
RW-1	<50	<50	450	1,800	2,250	130	<50	<50	<0.021
RW-2	<500	3,900	4,500	25,000	33,400	740	<500	<500	<0.020
RW-3	<50	360	380	1,400	2,140	160	<50	<50	<0.020
RW-4	<250	910	2,200	10,000	13,110	460	<250	<250	<0.020
DUP-1(MW-4)	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.022
Field Blank	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.021
Trip Blank	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	NT
WSW-1	<0.50	<0.50	0.22J	1.0	1.22J	<0.50	<0.50	<0.50	<0.020
WSW DUP	<0.50	<0.50	0.19J	1.0	1.19J	<0.50	<0.50	<0.50	<0.021
WSW Field Blank	<0.50	<0.50	<0.50	<0.50	BDL	<0.50	<0.50	<0.50	<0.020
WSW Trip Blank	<0.50	<0.50	<0.50	<0.50	BDL	<0.50	<0.50	<0.50	NT

Notes:

Groundwater samples collected on September 28, 2016.

Isopleth Interval = 10,000 ug/l

BDL = Below Detected Limits

Isopleths Computer Generated using Surfer by Golden Graphics and Modified by MECI Personnel.

"Deep" monitoring wells not used in Isopleth data.

NS = MW-1 is obstructed and unable to be sampled

Drawing Based on MECI Field Notes, Tax Maps, SCDHEC Files and a RLS Survey of the Site by Jay S. Joshi dated April 1, 2015.

GRAPHIC SCALE

0 30 60 90 120

1IN = 60FT

ALL LOCATIONS ARE APPROXIMATE

Groundwater CoC Site Map
(Total BTEX Isopleth)

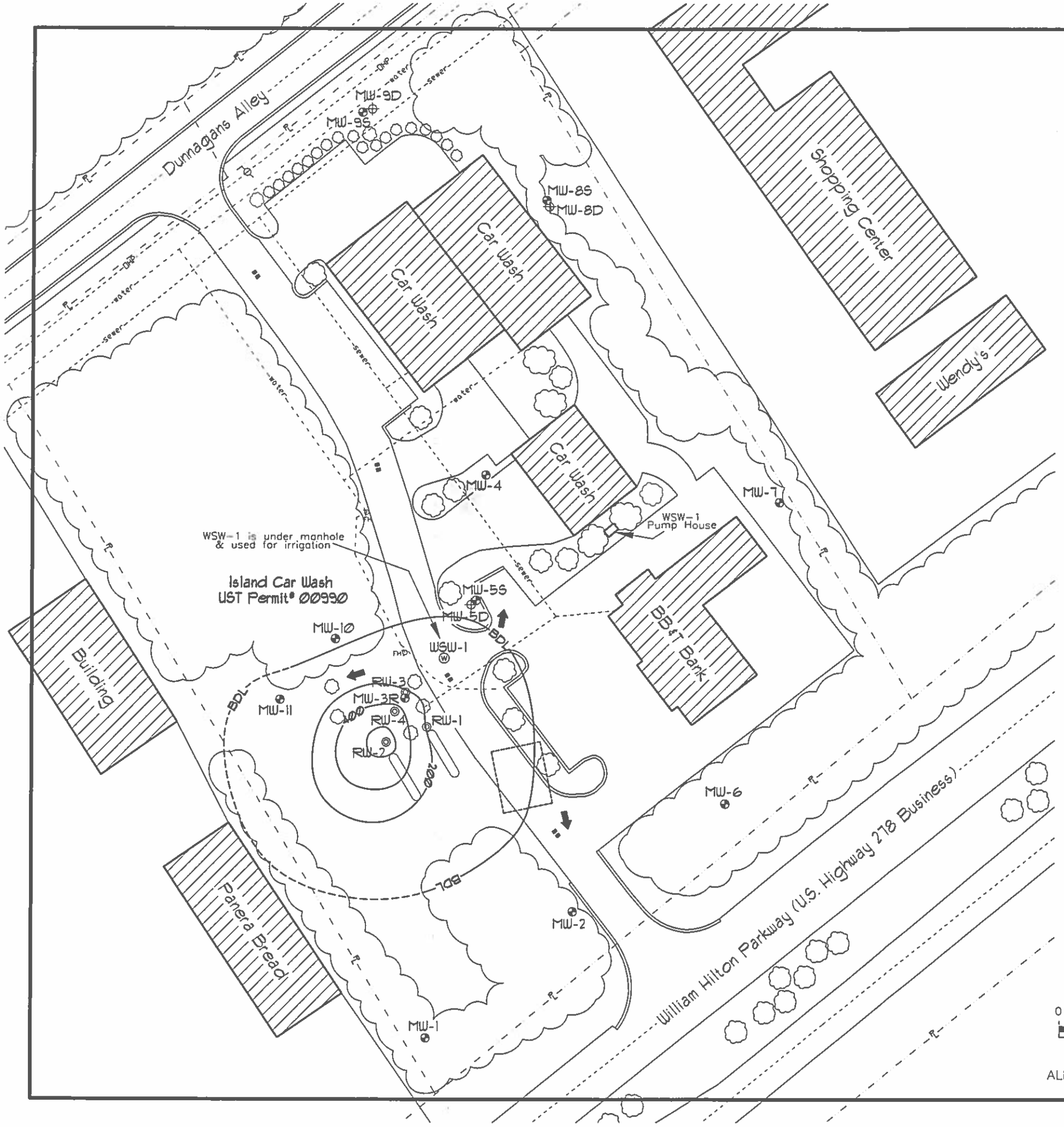
Island Car Wash
1008 William Hilton Parkway
Hilton Head Island, South Carolina
SCDHEC Site ID 00990

Midlands Environmental Consultants, Inc.

JOB NO. 16-5734

DATE October 10, 2016

FIGURE 4



Explanation:

- Location of Watertable Bracketing Monitoring Well
- Location of Water Supply Well
- Location of Double Cased "Deep" Monitoring Well
- Estimated Location of Removed Underground Storage Tanks
- Location of 4-Inch Recovery Well
- Storm Sewer Drop Inlet
- Naphthalene Concentration Isopleth (ug/l)

Groundwater COC Concentration Data

Sample #	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)	Total BTEX (ug/l)	Naphthalene (ug/l)	MTBE (ug/l)	12 DCA (ug/l)	EDB (ug/l)
MW-1	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-2	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.020
MW-3R	<250	1,900	2,000	9,400	13,300	400	<250	<250	<0.019
MW-4	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.020
MW-5s	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.020
MW-5D	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	51	<5.0	<0.020
MW-6	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.020
MW-7	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.020
MW-8s	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.021
MW-8D	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.021
MW-9s	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.021
MW-9D	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	2.4J	<5.0	<0.021
MW-10	<5.0	<5.0	<5.0	<5.0	BDL	1.2J	<5.0	<5.0	<0.020
MW-11	<5.0	1.1J	62	24	87.1J	19	<5.0	<5.0	<0.021
RW-1	<50	<50	450	1,800	2,250	130	<50	<50	<0.021
RW-2	<500	3,900	4,500	25,000	33,400	740	<500	<500	<0.020
RW-3	<50	360	380	1,400	2,140	160	<50	<50	<0.020
RW-4	<250	910	2,200	10,000	13,110	460	<250	<250	<0.020
DUP-1(MW-4)	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.022
Field Blank	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	<0.021
Trip Blank	<5.0	<5.0	<5.0	<5.0	BDL	<5.0	<5.0	<5.0	NT
WSW-1	<0.50	<0.50	0.22J	1.0	1.22J	<0.50	<0.50	<0.50	<0.020
WSW DUP	<0.50	<0.50	0.19J	1.0	1.19J	<0.50	<0.50	<0.50	<0.021
WSW Field Blank	<0.50	<0.50	<0.50	<0.50	BDL	<0.50	<0.50	<0.50	<0.020
WSW Trip Blank	<0.50	<0.50	<0.50	<0.50	BDL	<0.50	<0.50	<0.50	NT

Notes:
- Groundwater samples collected on September 28, 2016.
- Isopleth Interval = 200 ug/l
- BDL = Below Detected Limits
- Isopleths Computer Generated using Surfer by Golden Graphics and Modified by MECI Personnel.
- "Deep" monitoring wells not used in Isopleth data.
- NS = MW-1 is obstructed and unable to be sampled

Drawing Based on MECI Field Notes, Tax Maps, SCDHEC Files and a RLS Survey of the Site by Jay S. Joshi dated April 1, 2015.

GRAPHIC SCALE
0 30 60 90 120
1IN = 60FT

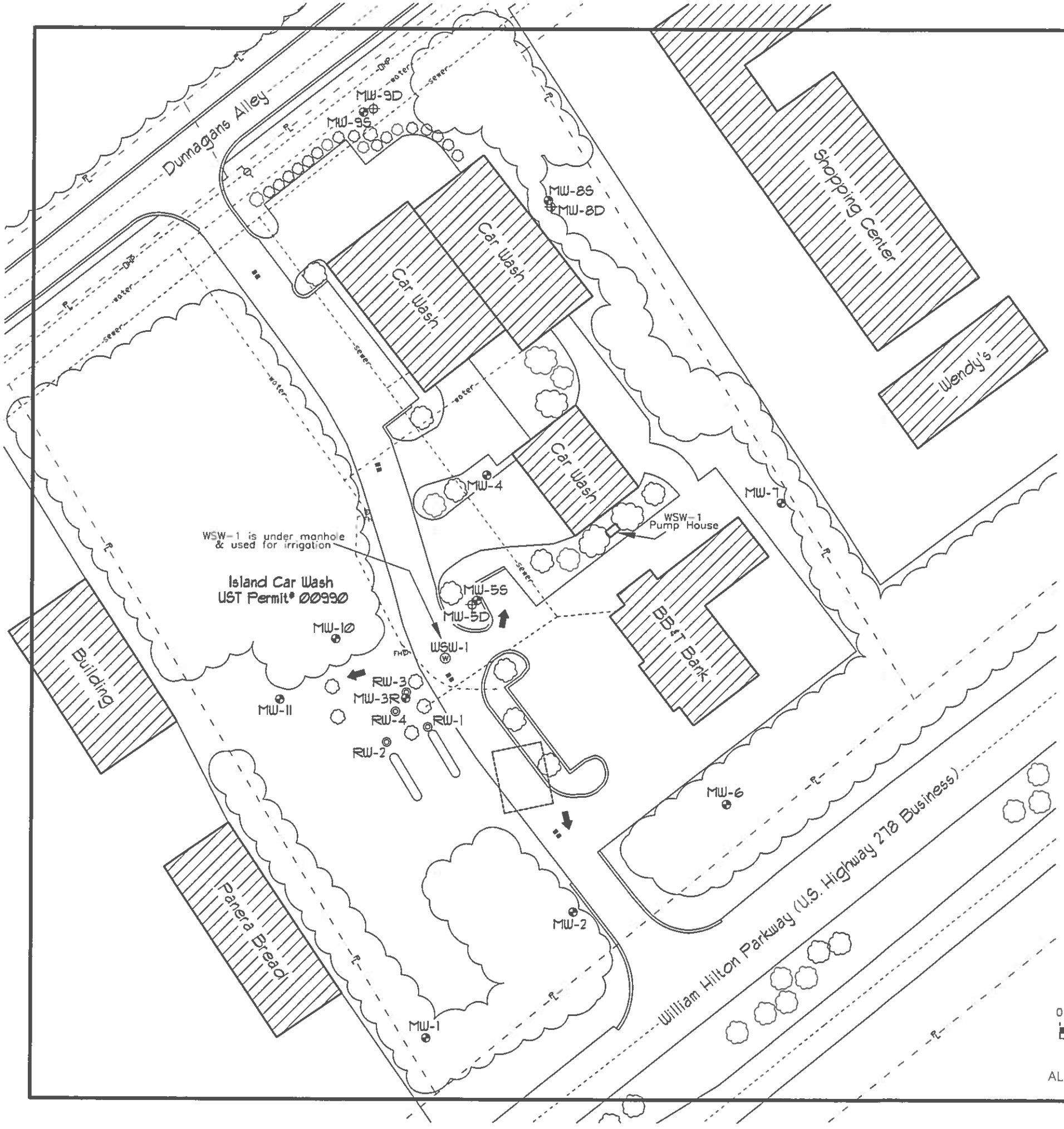
ALL LOCATIONS ARE APPROXIMATE

Groundwater CoC Site Map
(Naphthalene Isopleth)

Island Car Wash
1008 William Hilton Parkway
Hilton Head Island, South Carolina
SCDHEC Site ID 00990

Midlands Environmental Consultants, Inc.

JOB NO. 16-5734
DATE October 10, 2016
FIGURE 4A



Explanation:

- Location of Watertable Bracketing Monitoring Well
- Location of Water Supply Well
- Location of Double Cased "Deep" Monitoring Well
- Estimated Location of Removed Underground Storage Tanks
- Location of 4-Inch Recovery Well
- Storm Sewer Drop Inlet

Groundwater CoC Concentration Data - Oxygenates

Sample #	TAA (ug/l)	TAME (ug/l)	TBF (ug/l)	DIPE (ug/l)	3-3-Dimethyl-1-butanol (ug/l)	Ethanol (ug/l)	ETBE (ug/l)	TBA (ug/l)
MW-1	NS	NS	NS	NS	NS	NS	NS	NS
MW-2	<100	<10	<100	<10	<100	<1,000	<100	<100
MW-3R	<5,000	<500	<5,000	<500	<5,000	<50,000	<5,000	<5,000
MW-4	<100	<10	<100	<10	<100	<1,000	<100	<100
MW-5s	<100	<10	<100	<10	<100	<1,000	<100	<100
MW-5D	<100	<10	<100	<10	<100	<1,000	<100	12J
MW-6	<100	<10	<100	<10	<100	<1,000	<100	<100
MW-7	<100	<10	<100	<10	<100	<1,000	<100	<100
MW-8s	<100	<10	<100	<10	<100	<1,000	<100	<100
MW-8D	<100	<10	<100	<10	<100	<1,000	<100	<100
MW-9s	<100	<10	<100	<10	<100	<1,000	<100	<100
MW-9D	<100	<10	<100	<10	<100	<1,000	<100	<100
MW-10	<100	<10	<100	<10	<100	<1,000	<100	<100
MW-11	<100	<10	<100	<10	<100	<1,000	<100	<100
RW-1	<1,000	<100	<1,000	<100	<1,000	<10,000	<1,000	<1,000
RW-2	<10,000	<1,000	<10,000	<1,000	<10,000	<100,000	<10,000	<10,000
RW-3	<1,000	<100	<1,000	<100	<1,000	<10,000	<1,000	<1,000
RW-4	<5,000	<500	<5,000	<500	<5,000	<50,000	<5,000	<5,000
DUP-1(MW-4)	<100	<10	<100	<10	<100	<1,000	<100	<100
Field Blank	<100	<10	<100	<10	<100	<1,000	<100	<100
Trip Blank	<100	<10	<100	<10	<100	<1,000	<100	<100
WSW-1	<20	<10	<5.0	<5.0	<20	<100	<1.0	<20
WSW DUP	<20	<10	<5.0	<5.0	<20	<100	<1.0	<20
Field Blank	<20	<10	<5.0	<5.0	<20	<100	<1.0	<20
Trip Blank	<20	<10	<5.0	<5.0	<20	<100	<1.0	<20

Notes: Groundwater samples collected on September 28, 2016.

DIPE = Diisopropyl Ether

ETBE = Ethyl tert-butyl Ether

TAA = tert- Amyl Alcohol

TAME = tert-Amy Methyl Ether

TBA = tert-Butyl Alcohol

TBF = tert-Butyl Formate

GRAPHIC SCALE

0 30 60 90 120

1IN = 60FT

ALL LOCATIONS ARE APPROXIMATE

Drawing Based on MECI Field Notes, Tax Maps, SCDHEC Files and a RLS Survey of the Site by Jay S. Joshi dated April 1, 2015.

Groundwater CoC Site Map
(Oxygenates)

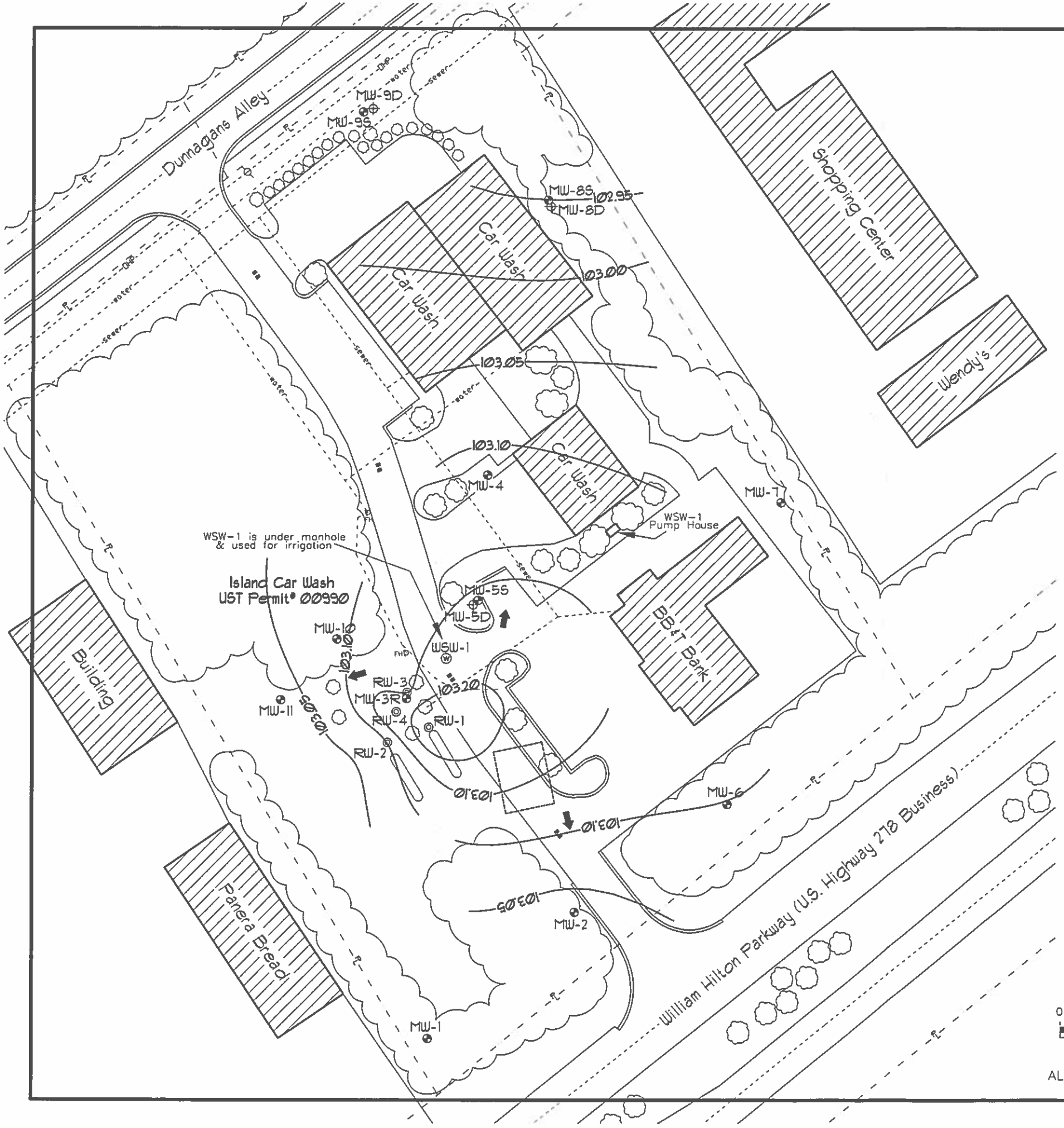
Island Car Wash
1008 William Hilton Parkway
Hilton Head Island, South Carolina
SCDHEC Site ID 00990

Midlands Environmental Consultants, Inc.

JOB NO. 16-5734

DATE October 10, 2016

FIGURE 4B



Explanation:

- Location of Watertable Bracketing Monitoring Well
- Location of Water Supply Well
- Location of Double Cased "Deep" Monitoring Well
- Estimated Location of Removed Underground Storage Tanks
- Location of 4-Inch Recovery Well
- Storm Sewer Drop Inlet

- OHP — Overhead Powerline
- P — Property Line
- water — Buried Water Line
- sewer — Buried Sewer

Potentiometric Data

Well #	Screened Interval (feet)	Depth to Water (ft.)	Well Head Elevation	Groundwater Elevation
MW-1	4-14	NS	109.66	NS
MW-2	3-13	6.03	109.06	103.03
MW-3R	4-14	7.21	110.35	103.14
MW-4	4-14	7.19	110.31	103.12
MW-5S	4-14	7.29	110.16	102.87
MW-5D	25-30	7.27	110.47	103.20
MW-6	4-14	5.43	108.53	103.10
MW-7	4-14	6.02	109.28	103.26
MW-8S	4-14	7.12	110.07	102.95
MW-8D	25-30	7.30	109.93	102.63
MW-9S	4-14	7.14	110.22	103.08
MW-9D	25-30	7.43	109.88	102.45
MW-10	4-14	8.69	111.78	103.09
MW-11	4-14	8.93	111.96	103.03
RW-1	3.5-13.5	6.65	109.93	103.28
RW-2	4.5-14.5	7.18	110.24	103.06
RW-3	3-15	7.52	110.66	103.14
RW-4	3-15	7.50	110.75	103.25

Notes: Depth to groundwater measured on September 28, 2016.
Site Datum Based on Assumed Spot Elevation.
NS = Not Sampled

GRAPHIC SCALE
0 30 60 90 120
1IN = 60FT

ALL LOCATIONS ARE APPROXIMATE

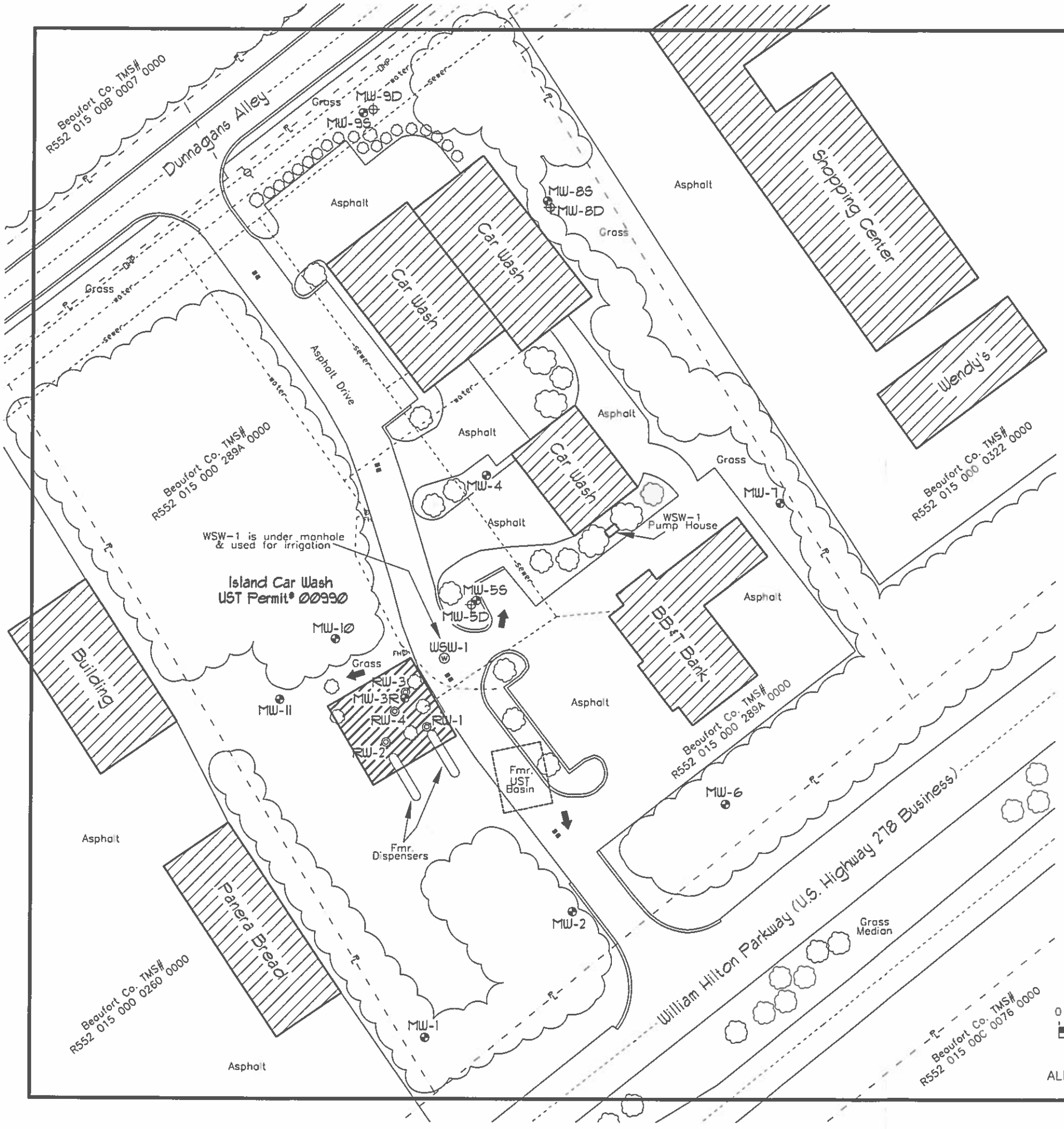
Drawing Based on MECI Field Notes, Tax Maps, SCDHEC Files and a RLS Survey of the Site by Jay S. Joshi dated April 1, 2015.

Potentiometric Data Site Map

Island Car Wash
1008 William Hilton Parkway
Hilton Head Island, South Carolina
SCDHEC Site ID 00990

Midlands Environmental Consultants, Inc.

JOB NO. 16-5734
DATE October 10, 2016
FIGURE 5



Explanation:

- Location of Watertable Bracketing Monitoring Well
- Location of Double Cased "Deep" Monitoring Well
- Location of 4-inch Recovery Well
- Location of Water Supply Well
- Estimated Location of Removed Underground Storage Tanks
- Storm Sewer Drop Inlet
- OHP — Overhead Powerline
- P — Property Line
- water — Buried Water Line
- sewer — Buried Sewer
- Proposed Injection Area

GRAPHIC SCALE

0 30 60 90 120

1IN = 60FT

ALL LOCATIONS ARE APPROXIMATE

Drawing Based on MECI Field Notes, Tax Maps, SCDHEC Files and a RLS Survey of the Site by Jay S. Joshi dated April 1, 2015.

Proposed Injection Area
(40 Points)

Island Car Wash
1008 William Hilton Parkway
Hilton Head Island, South Carolina
SCDHEC Site ID 00990

Midlands Environmental Consultants, Inc.

JOB NO. 15-5734
DATE November 30, 2016
FIGURE 6

APPENDIX A

SITE SPECIFIC WORK PLAN

Midlands Environmental Consultants, Inc.

D H E C
PROMOTE PROTECT PROSPER

Site-Specific Work Plan for Approved ACQAP
Underground Storage Tank Management Division

To: Mr. John Bryant (SCDHEC Project Manager)
From: Mr. Jeff Coleman (Contractor Project Manager)
Contractor: Midlands Environmental Consultants, Inc. UST Contractor Certification Number: 009

Facility Name: Island Car Wash UST Permit #: 00990
Facility Address: 1008 William Hilton Parkway, Hilton Head Island, SC 29928
Responsible Party: Bell Fuels, Inc. Phone: 773-286-0200
RP Address: 5041 W. Pershing Road, Cicero, IL 60804-4544
Property Owner (if different): SAA
Property Owner Address: SAA
Current Use of Property: Car Wash / Bank

Scope of Work (Please check all that apply)

☐ IGWA ☐ Tier II ☑ Groundwater Sampling ☐ GAC
☐ Tier I ☐ Monitoring Well Installation ☐ Other _____

Analyses (Please check all that apply)

Groundwater/Surface Water:

☑ BTEXNMDCA (8260B) ☐ Lead ☐ BOD ☐ Methane
☑ Oxygenates (8260B) ☐ 8 RCRA Metals ☐ Nitrate ☐ Ethanol
☑ EDB (8011) ☐ TPH ☐ Sulfate ☐ Dissolved Iron
☐ PAH (8270D) ☐ pH ☐ Other _____

Soil:

☐ BTEXN ☐ 8 RCRA Metals ☐ TPH-DRO (3550B/8015B) ☐ Grain Size
☐ PAH ☐ Oil & Grease (9071) ☐ TPH-GRO (5030B/8015B) ☐ TOC

Air:

☐ BTEXN

Sample Collection (Estimate the number of samples of each matrix that are expected to be collected.)

_____ Soil	1 Water Supply Wells	_____ Air	2 Field Blank
18 Monitoring Wells	_____ Surface Water	2 Duplicate	2 Trip Blank

Field Screening Methodology

Estimate number and total completed depth for each point, and include their proposed locations on the attached map.
# of shallow points proposed: _____ Estimated Footage: _____ feet per point
# of deep points proposed: _____ Estimated Footage: _____ feet per point
Field Screening Methodology: _____

Permanent Monitoring Wells

Estimate number and total completed depth for each well, and include their proposed locations on the attached map.
# of shallow wells: _____ Estimated Footage: _____ feet per point
# of deep wells: _____ Estimated Footage: _____ feet per point
# of recovery wells: _____ Estimated Footage: _____ feet per point
Monitoring Well development method (consistent with SOP): _____
Comments, if warranted:

_____
_____
_____

UST Permit #: 00990 Facility Name: Island Car Wash

Implementation Schedule (Number of calendar days from approval)
Field Work Start-Up: Dependant Field Work Completion: Dependant
Report Submittal: Dependant # of Copies Provided to Property Owners: 2

Aquifer Characterization
Pump Test: ☐ Slug Test: ☐ (Check one and provide explanation below for choice)

Investigation Derived Waste Disposal
Soil: _____ Tons Purge Water: 200.0 Gallons
Drilling Fluids: _____ Gallons Free-Phase Product: _____ Gallons

Additional Details For This Scope of Work
For example, list wells to be sampled, wells to be abandoned/repaired, well pads/bolts/caps to replace, details of AFVR event, etc.
-Sampling activities will be performed following injection and AFVR activties.

Compliance With Annual Contractor Quality Assurance Plan (ACQAP)
Yes Laboratory as indicated in ACQAP? (Yes/No) If no, indicate laboratory information below.
Name of Laboratory: _____
SCDHEC Certification Number: _____
Name of Laboratory Director: _____

N/A Well Driller as indicated in ACQAO? (Yes/No) If no, indicate driller information below.
Name of Well Driller: _____
SCLLR Certification Number: _____

N/A Other variations from ACQAP. Please describe below.

Attachments
1. Attach a copy of the relevant portion of the USGS topographic map showing the site location.
2. Prepare a site base map. This map must be accurately scaled, but does not need to be surveyed. The map must include the following:
   - North Arrow
   - Location of property lines
   - Location of buildings
   - Previous soil sampling locations
   - Previous monitoring well locations
   - Proposed soil boring locations
   - Proposed monitoring well locations
   - Legend with facility name and address, UST permit number, and bar scale
   - Streets or highways (indicate names and numbers)
   - Location of all present and former ASTs and USTs
   - Location of all potential receptors
3. Assessment Component Cost Agreement, SCDHEC Form D-3664

ASSESSMENT COMPONENT COST AGREEMENT
SOUTH CAROLINA
Department of Health and Environmental Control
Underground Storage Tank Management Division
State Underground Petroleum Environmental Response Bank Account
August 16, 2016

Healthy People. Healthy Communities.

Facility Name: Island Car Wash

UST Permit #: 00990 **Cost Agreement #:** Proposal

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL
1. **Plan Preparation**				
A1. Site-specific Work Plan	1	each	$150.00	$150.00
B1. Tax Map		each	$70.00	$0.00
C1. Tier II or Comp. Plan /QAPP Appendix B		each	$250.00	$0.00
2. A1. **Receptor Survey** *		each	$551.00	$0.00
3. **Survey (500 ft x 500 ft)**				
A1. Comprehensive Survey		each	$1,040.00	$0.00
B. Subsurface Geophysical Survey				
1B. < 10 meters below grade		each	$1,300.00	$0.00
2B. > 10 meters below grade		each	$2,310.00	$0.00
C1. Geophysical UST or Drum Survey		each	$910.00	$0.00
4. **Mob/Demob**				
A1. Equipment	1	each	$1,020.00	$1,020.00
B1. Personnel	3	each	$423.00	$1,269.00
C1. Adverse Terrain Vehicle		each	$500.00	$0.00
5. A1. **Soil Borings (hand auger)***		foot	$5.00	$0.00
6. **Soil Borings (requiring equipment, push technology, etc)* or Field Screening (including water ssample, soil sample, soil gas sample, etc.)***				
AA. Standard	600	per foot	$15.00	$9,000.00
C1. Fractured Rock		per foot	$20.20	$0.00
7. A1. **Soil Leachability Model**		each	$60.00	$0.00
8. **Abandonment (per foot)***				
A1. 2" diameter or less	600	per foot	$3.10	$1,860.00
B1. Greater than 2" to 6" diameter		per foot	$4.50	$0.00
C1. Dug/Bored well (up to 6 feet diameter)		per foot	$15.00	$0.00
9. **Well Installation (per foot)***				
A1. Water Table (hand augered)		per foot	$10.60	$0.00
B1. Water Table (drill rig)		per foot	$38.00	$0.00
CC. Telescoping		per foot	$50.00	$0.00
DD. Rock Drilling		per foot	$58.00	$0.00
E1. 2" Rock Coring		per foot	$30.90	$0.00
G1. Rock Multi-sampling ports/screens		per foot	$33.40	$0.00
HH. Recovery Well (4" diameter)		per foot	$45.00	$0.00
II. Pushed Pre-packed screen (1.25" dia)		per foot	$15.00	$0.00
J1. Rotosonic (2" diameter)		per foot	$44.00	$0.00
K. Re-develop Existing Well		per foot	$11.00	$0.00
10. **Groundwater Sample Collection / Gauge Depth to Water or Product ***				
A1. Groundwater Purge	18	er well/recept	$60.00	$1,080.00
B1. Air or Vapors		per recepto	$12.00	$0.00
C1. Water Supply	1	er well/recept	$22.00	$22.00
D1. Groundwater No Purge or Duplicate	2	er well/recept	$28.00	$56.00
E1. Gauge Well only		per well	$7.00	$0.00
F1. Sample Below Product		per well	$12.00	$0.00
G1. Passive Diffusion Bag		each	$26.00	$0.00
H1. Field Blank	2	each	$24.60	$49.20

11. Laboratory Analyses-Groundwater					
A2. BTEXNM+Oxyg's+1,2 DCA+Eth(82	21	per sample	$122.00		$2,562.00
AA1. Lead, Filtered		per sample	$13.80		$0.00
B2. Rush EPA Method 8260B (All of item A.)		per sample	$153.60		$0.00
C2. Trimethal, Butyl, and Isopropyl Benzenes		per sample	$36.40		$0.00
D1. PAH's		per sample	$60.60		$0.00
E1. Lead		per sample	$16.00		$0.00
F1. EDB by EPA 8011	20	per sample	$45.20		$904.00
FF1. EDB by EPA Method 8011 Rush		per sample	$68.20		$0.00
G1. 8 RCRA Metals		per sample	$63.40		$0.00
H1. TPH (9070)		per sample	$41.00		$0.00
II. pH		per sample	$5.20		$0.00
J1. BOD		per sample	$20.00		$0.00
PP. Ethanol		per sample	$14.80		$0.00
11. Analyses-Drinking Water					
L. BTEXNM+1,2 DCA (524.2)	4	per sample	$124.05		$496.20
M. 7-OXYGENATES & ETHANOL (8260B)	4	per sample	$91.75		$367.00
N. EDB (504.1)	3	per sample	$79.50		$238.50
O. RCRA METALS (200.8)		per sample	$100.00		$0.00
11. **Analyses-Soil**					
Q1. BTEX + Naphth.		per sample	$64.00		$0.00
R1. PAH's		per sample	$64.04		$0.00
S1. 8 RCRA Metals		per sample	$56.40		$0.00
U1. TPH-DRO (3550C/8015C)		per sample	$40.00		$0.00
V1. TPH- GRO (5030B/8015C)		per sample	$35.96		$0.00
W1. Grain size/hydrometer		per sample	$104.00		$0.00
X1. Total Organic Carbon		per sample	$30.60		$0.00
11. **Analyses-Air**					
Y1. BTEX + Naphthalene		per sample	$216.00		$0.00
11. **Analyses-Free Phase Product**					
Z1. Hydrocarbon Fuel Identification		per sample	$357.00		$0.00
12. **Aquifer Characterization**					
A1. Pumping Test*		per hour	$23.00		$0.00
B1. Slug Test*		per test	$191.00		$0.00
C1. Fractured Rock		per test	$100.00		$0.00
13. A1. **Free Product Recovery Rate Test***		each	$38.00		$0.00
14. **Fate/Transport Modeling**					
A1. Mathematical Model		each	$100.00		$0.00
B1. Computer Model		each	$100.00		$0.00
15. **Risk Evaluation**					
A. Tier I Risk Evaluation		each	$300.00		$0.00
B1. Tier II Risk Evaluation		each	$100.00		$0.00
16. A1. **Subsequent Survey***		each	$260.00		$0.00
17. **Disposal (gallons or tons)***					
AA. Wastewater	200	gallon	$0.56		$112.00
BB. Free Product		gallon	$0.50		$0.00
C1. Soil Treatment/Disposal		ton	$60.00		$0.00
D1. Drilling fluids		gallon	$0.42		$0.00
18. **Miscellaneous (attach receipts)**					
		each	$0.00		$0.00
		each	$0.00		$0.00
		each	$0.00		$0.00
20. **Tier I Assessment (Use DHEC 3665 form)**		standard			$0.00
21. IGWA **(Use DHEC 3666 form)**		standard			$0.00
22. **Corrective Action (Use DHEC 3667 form)**		PFP Bid			$0.00

23. **Aggressive Fluid & Vapor Recovery (AFVR)**				
A1. 8-hour Event*		each	$1,375.00	$0.00
AA. 24-hour Event*		each	$3,825.00	$0.00
A3. 48-hour Event*		each	$6,265.00	$0.00
A4. 96-hour Event*	3	each	$12,567.50	$37,702.50
C1. Off-gas Treatment 8 hour		per event	$122.50	$0.00
C2. Off-gas Treatment 24 hour		per event	$241.50	$0.00
C3. Off-gas Treatment 48 hour		per event	$327.00	$0.00
C4. Off-gas Treatment 96 hour	3	per event	$780.00	$2,340.00
D. Site Reconnaissance		each	$203.25	$0.00
E1. Additional Hook-ups		each	$25.75	$0.00
F1. Effluent Disposal	80,000	gallon	$0.44	$35,200.00
G. AFVR Mobilization/Demobilization	3	each	$391.50	$1,174.50
24. **Granulated Activated Carbon (GAC) filter system installation & service:**				
A1. New GAC System Installation*		each	$1,900.00	$0.00
BB. Refurbished GAC Sys. Install*		each	$900.00	$0.00
C1. Filter replacement/removal*		each	$350.00	$0.00
DD. GAC System removal, cleaning, & refurbishment*		each	$275.00	$0.00
E1. GAC System housing*		each	$250.00	$0.00
F. In-line particulate filter		each	$150.00	$0.00
G1. Additional piping & fittings		foot	$1.50	$0.00
25. **Well Repair**				
A1. Additional Copies of the Report Delivered		each	$50.00	$0.00
B1. Repair 2x2 MW pad*		each	$50.00	$0.00
C1. Repair 4x4 MW pad*		each	$88.00	$0.00
D1. Repair well vault*		each	$118.00	$0.00
F1. Replace well cover bolts		each	$2.60	$0.00
G. Replace locking well cap & lock		each	$15.00	$0.00
H1. Replace/Repair stick-up*		each	$134.00	$0.00
II. Convert Flush-mount to Stick-up*		each	$150.00	$0.00
J1. Convert Stick-up to Flush-mount*		each	$130.00	$0.00
K1. Replace missing/illegible well ID plate		each	$12.00	$0.00
Report Prep & Project Management	12%	percent	$95,602.90	$11,472.35
TOTAL				$107,075.25

*The appropriate mobilization cost can be added to complete these tasks, as necessary

APPENDIX B

UNDERGROUND INJECTION PERMIT APPLICATION

Midlands Environmental Consultants, Inc.

November 30, 2016

Bruce Crawford
Underground Injection Control Program
Bureau of Water
2600 Bull Street
Columbia, SC 29201

Subject: Underground Injection Control Permit Application
Island Car Wash
1008 William Hilton Parkway
Hilton Head Island, SC
SCDHEC Site ID# 00990

Dear Mr. Crawford,

Midlands Environmental Consultants, Inc. (Midlands Environmental) is pleased to submit the attached Underground Injection Control Permit Application for the subject site.

Midlands Environmental has been awarded a remediation by SCDHEC to remediate petroleum impacted groundwater at the subject site. MECI proposes a supplemental rehabilitative approach composed of direct injection of a pulverized activated carbon based product into the areas surrounding the recovery wells and MW-3R to further reduce concentrations of petroleum hydrocarbons. A direct-push drilling rig, operated by a SC certified well driller, will be used to install the injection points. Injection rods will be pushed to a first interval, the appropriate amount of activated carbon based product mixed with potable water will be injected, the rods will be pushed an additional five feet, and the process will continue to the termination depth. The deepest injection interval at each point will be 15 feet below ground surface (BGS). During the injection event, should the product surface or enter monitoring wells, it will be removed using vacuum extraction. The product is not hazardous and only presents a dust nuisance if it surfaces. Once the injection process is complete the potential for surfacing of the product is eliminated.

Our current scope of work will be to conduct an injection event to further reduce dissolved phase CoC's at the site. The proposed injection event will include forty (40) injection points, with three (3) 5-foot injection intervals per point. At each injection point, fifty (50) gallons of potable water will be mixed with an appropriate amount of a pulverized activated carbon based product. The exact proportions of water to the pulverized activated carbon based product will be determined on-site, but it is anticipated to be a one to one ratio with 50 pounds of pulverized activated carbon mixed with 50 gallons of water. An approximate total of 2,000 pounds of pulverized activated carbon based product will be injected during the injection event. The proposed injection event should take between 3 and 5 days depending on site conditions.

Post Office Box 854, Lexington SC 29071 • 231 Dooley Road, Lexington, SC 29073
Telephone: (803) 808-2043 • fax: (803) 808-2048

The site is located approximately 1/4-mile east of the intersection of William Hilton Parkway (U.S. Highway 278 Business) and Arrow Road. Currently the subject property contains a BB&T Bank and Car Wash in the eastern portion of the property and the former gasoline service station was located in the western portion of the property. William Hilton Parkway forms the southern border of the property, beyond which are commercial properties. Dunnagans Alley borders the site to the north, beyond which a recreational resort. Commercial properties are located to the east and west of the subject site.

The following attachments are included:

Attachment H-1 - Topographic map
Attachment H-2 - Scaled site map that includes all monitoring wells in the area of the subject site
Attachment H-4 - Groundwater CoC Site Map (TOTAL BTEX ISOPLETH)
Attachment H-4A - Groundwater CoC Site Map (NAPHTHALENE ISOPLETH)
Attachment H-4B - Groundwater CoC Site Map (OXYGENATES)
Attachment H-5 - Potentiometric data site map
Attachment H-6 – Proposed Injection Area

In addition to the attached figures, please find the completed Underground Injection Control Permit Application.

Midlands Environmental appreciates your time in consideration of this application. If we could be of any assistance please feel free to call me at (803) 808-2043.

Sincerely,
Midlands Environmental Consultants, Inc.

Kyle V. Pudney
Project Biologist

Form I UIC	Underground Injection Control Permit Application Ground-Water Protection Division (Collected under the Authority of Title 48 Chapter 1 of the 1976 South Carolina Code of Laws)	I. EPA ID NUMBER		T/A	C
		U			

Read attached instructions before starting.
For OfficialUse Only

Application Approved month day year	Date Received month day year	Permit Well Number

Comments

II. Facility Name and Address	III. Owner/Operator and Address
Facility Name: Island Car Wash, SCDHEC UST Site ID# 00990	Owner/OperatorName: Midlands Environmental Consultants, Inc.
Street Address: 1008 William Hilton Parkway	Street Address: 231 Dooley Road
City: Hilton Head Island; State: South Carolina; Zip Code: 29928	City: Lexington; State: South Carolina; Zip Code: 29073

IV. Ownership Status (Select One)	V. SIC Codes
☐ A. Federal ☐ B. State ☒ C. Private ☐ D. Public ☐ E. Other (Explain)	

VI. Well Status (Select A, B or C)

☐ A. Operating	Date Started *(MM/DD/YYYY)*	☐ B. Modification/Conversion	☒ C. Proposed

VII. Type of Permit Requested - Class and Type of Well (see reverse)

A. Class(es) enter code(s)	B. Type(s) enter code(s)	C. If class is "other" or type is code 'Y', explain	D. Number of Wells per type
V.A	I		40

VIII. Location of Wells or Approximate Center of field or Project

C	A. Latitude				B. Longitude			
		Deg	Min	Sec		Deg	Min	Sec
I		32	9	32 N		80	45	22 W

IX. Attachments

Complete the following questions on a separate sheet(s) and number accordingly; see instructions for Classes II, III, and V, complete and submit on a separate sheet(s) attachments A-U as appropriate. Attach maps where required. List attachments by letter which are applicable and include with your application.

X. Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

A. Name (Type or Print)	Title	B. Phone No.
Bryan T. Shane, P.G.	Principal Geologist	(803) 808-2043

C. Signature	D. Date Signed (MM/DD/YYYY)
[signature]	11/30/2016

DHEC2502(08/1997)

Well Class and Type Codes

Class I — Industrial, municipal, and other injection wells for the subsurface disposal of fluids. (Prohibited)

Class II — Oil and gas production and storage related injection wells.

Type	"D"	Produced fluid disposal well
	"R"	Enhanced recovery well
	"R"	Hydrocarbon storage well (excluding natural gas)
	"X"	Other Class II wells

Class III — Special process injection wells.

Type	"G"	Solution mining well
	"S"	Sulfur mining well by frasch process
	"U"	Uranium mining well (excluding solution mining of conventional mines)
	"X"	Other Class III wells

Class IV — Hazardous or radioactive waste disposal injection wells. (Prohibited)

Class V.A — Injection wells not included in Class I, II, III, IV or V.B

Type	"A"	Storm runoff drainage wells
	"B"	Aquifer recharge wells
	"C"	Salt-water intrusion barrier wells
	"D"	Subsidence control wells
	"E"	Backfill wells associated with subsurface mining
	"F"	Geothermal energy recovery wells
	"G"	Experimental technology well
	"H"	Natural gas storage wells
	"I"	Corrective action wells

Class V.B — Non-contact return flow system wells

Type	"A"	Heat pump return flow wells
Type	"B"	Cooling water return flow wells

Instructions for Attachments to Form 1
Underground Injection Control
for Corrective Action Wells
(effective 01/91)

The following ATTACHMENTS should be submitted with an underground injection control (UIC) permit application for Class V.A. corrective action wells associated with aquifer remediation that are to be used to inject fluid whose chemical constituents are below all drinking water standards, as established under R.61-58.5.

Attachment A: Activity for Review

Submit a brief description of the activities to be conducted that require a UIC permit.

Attachment B: Well Construction Details

Submit schematic or other appropriate drawings of the surface and subsurface construction details of the recovery and injection wells.

Attachment C: Operating Data

Submit the following proposed operating data for each injection well:

1) Average and maximum daily rate and volume of fluid to be injected. In addition, indicate the average and maximum daily rate and volume of fluid to be withdrawn from each recovery well. Verification of the aquifer's hydraulic ability to produce and accept the quantities proposed should be presented.

2) Average and maximum injection pressure.

3) Pumping schedule (i.e. continuous, alternating cycles, etc.).

4) Proposed ranges in the concentration of all contaminant constituents within the injection fluid. Include comprehensive ground-water quality data from a "worst case" well sample.

5) Length of time the project is expected to require injection to complete remediation (to ensure the effective dates of the permit will allow sufficient time to complete the project).

Attachment D: Monitoring Program

Discuss the planned monitoring program in detail:

1) Include a discussion of monitoring devices, sampling frequency (sufficient to verify treatment system efficiency), sampling protocol, sampling location, parameters to be analyzed, and proposed method(s) of analysis.

2) This plan should indicate how, through monitoring, the proposed contaminant levels in the injectate will be verified.

3) This plan should also clearly illustrate exactly how hydraulic control of the contaminant plume (and injectate, where relevant) will be verified through monitoring (i.e., piezometers, quality analyses, etc.).

Attachment E: Existing or Pending State/Federal Permits

List the program and permit number of any existing State or Federal permits for the facility (i.e., NPDES, RCRA, UST, etc.).

Attachment F: Description of Business

Give a brief description of the nature of the business of the facility and any immediately adjacent facilities.

Attachment G: Area of Review

1) The area of review should be a fixed radius of 1/4 mile from the injection well, the outermost injection wells (if a wellfield).

2) If a fixed radius is not selected, the methods and the calculations used to determine the size of the area of review should be submitted.

Attachment H: Maps of Wells and Area of Review

1) Submit a topographic map of the area, extending one mile beyond the project property boundaries. This map should show all hazardous waste treatment, storage, or disposal facilities, and all intake and discharge structures associated with the project facility. Any known areas of soil and/or ground-water contamination within a one mile radius should be indicated. Also indicate all surface bodies of water, springs, mines (surface and subsurface), quarries, and other pertinent surface features such as residences, roads, and geologic faults (known or suspected).

2) A scaled map(s) should be included which shows the name and/or number and the location of ALL production, injection, monitoring, abandoned and dry wells within the area of review. This should be accomplished by file and field surveys. Information regarding the construction (i.e., total depth, diameter, casing/screened intervals, grouting, etc.) and the current status (i.e., actively used, temporarily abandoned, permanently abandoned) of ALL wells within the area of review should be submitted. If any wells have been abandoned, details on the method the wells were abandoned (i.e., cemented/grouted, filled with sand, etc.) should be included.

3) A potentiometric map of the project site should be submitted which accurately locates all monitoring wells and proposed recovery and injection wells and outlines the horizontal extent of both the free-phase contaminant (where applicable) and dissolved contaminant plumes. Include all water level and product thickness data. The date and time that water levels and product thicknesses were measured should be indicated.

Attachment I: Cross Sections/Diagrams

1) Geologic cross sections indicating the lithology and stratigraphy of the site and the horizontal and vertical extent of the contaminant plume, should be submitted. At least two stratigraphic cross sections, one parallel and one perpendicular to the horizontal ground-water flow direction, should be submitted. In areas where the site stratigraphy is complex, additional cross sections should be submitted to clearly illustrate the local conditions.

2) A schematic diagram, in the form of a cross section, showing the proposed remediation system with the components of flow (above and below ground) and all associated appurtenances (i.e., stripping tower, piping, wells, etc.).

Attachment J: Name and Depth of Underground Sources of Drinking Water (USDW's)

Identify and describe all aquifers which may be affected by the injection.

Attachment K: Hydraulic Control

1) Sufficient supporting data (i.e. time/drawdown data, Theis curves and methods, calculations, etc.), used to determine aquifer characteristics to verify complete hydraulic control over the contaminant plume (and injectate, if proposed injectate quality does not conform to classified ground-water standards) during injection should be submitted. At a minimum, values should be given for transmissivity, hydraulic conductivity, effective porosity and specific yield.

2) Demonstrate the presence and magnitude of, or the absence of, any vertical hydraulic gradient at the site. If a vertical hydraulic gradient exists, show how its direction and magnitude are incorporated in the calculations demonstrating hydraulic control.

3) Ground-water flow computer models (especially 2-D map view with potentiometric and flow lines) may be utilized and submitted. All calculations should be in English units. All model-derived data and maps should be properly labeled and keyed so as to be clearly understood.

Subsequent Action

After receipt of a complete Underground Injection Control Permit Application, the Department will make a determination to deny or issue a Permit to Construct the injection well(s). After the well(s) is/are constructed, the Department should be notified in writing of the well(s) completion and sent a copy of the completed well record form(s) signed by a South Carolina certified well driller which illustrates the "as built" well construction. If the system is in compliance with the approved application, the Department may then issue an Approval to Operate. This Approval to Operate is the final permission necessary prior to injection.

Attachment I

Depth (Feet)	Description	PID PPM	Well Diagram	Penetration Blows Per Foot 0 5 10 20 40 60 80 100
	Grass with Topsoil			
	COASTAL PLAIN SEDIMENT: Tan and Gray, Medium SAND			NO BLOWCOUNTS RECORDED
5		50.5		
10		67.2		
15	Boring Terminated at 15.0 Feet Below Ground Surface (BGS). Recovery Well Installed to 15.0 Feet BGS. Groundwater Measured at 6.04 Feet Below Top of Casing on March 23, 2015.	74.9		
20				
25				
30				
35				

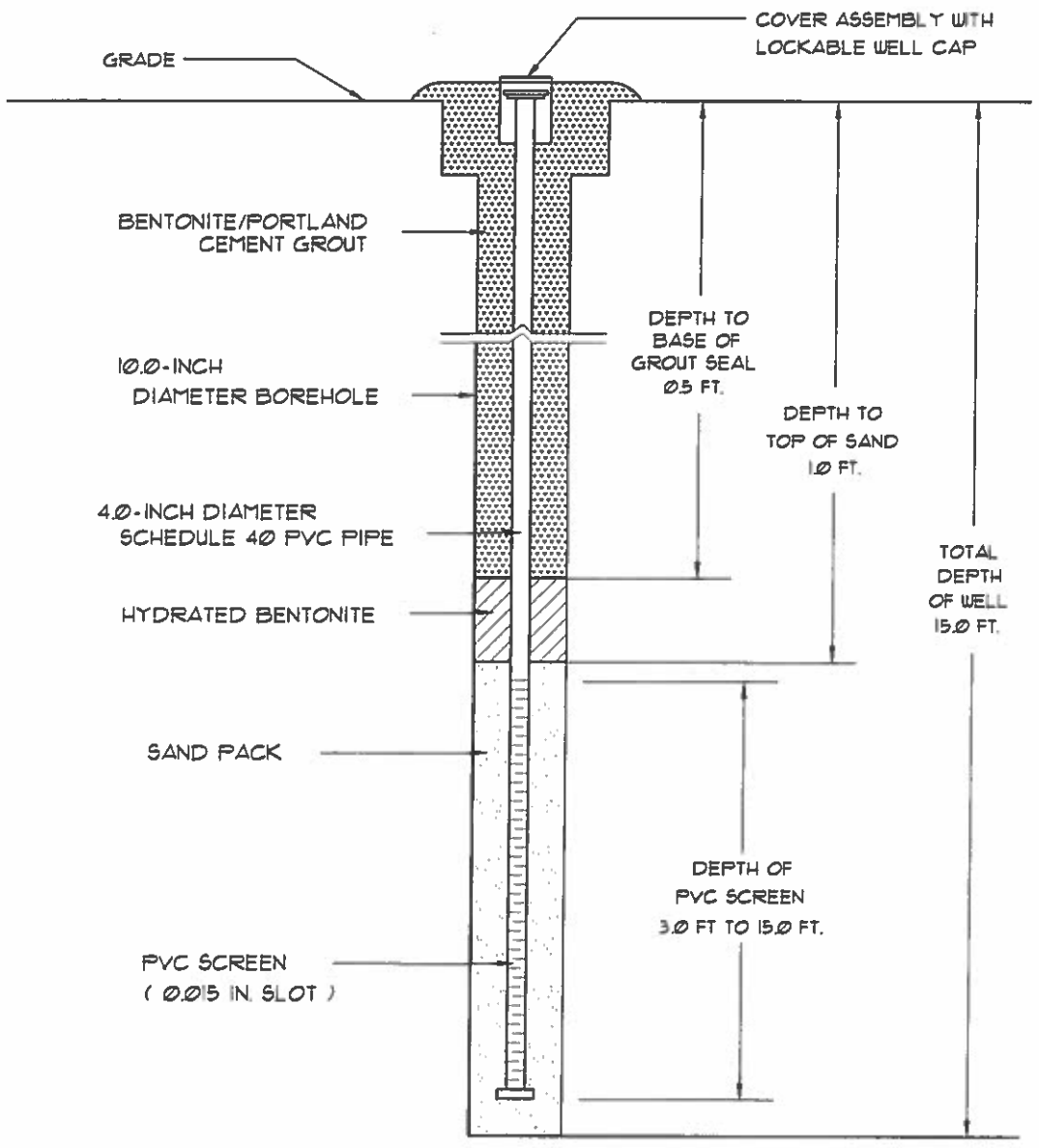
TEST BORING RECORD
Island Car Wash
Hilton Head Island, SC
SCDHEC Site ID# 00990
MECI Project Number 15-5118

Boring Number:	RW-3 (00990)
Date Drilled:	03/19/2015
Drilled By:	Environmental Drilling & Probing Services
Logged By:	T. Elder

Prepared By:
Midlands Environmental Consultants, Inc.
231 Dooley Road
Lexington, South Carolina 29073
(803) 808-2043 Fax: 808-2048

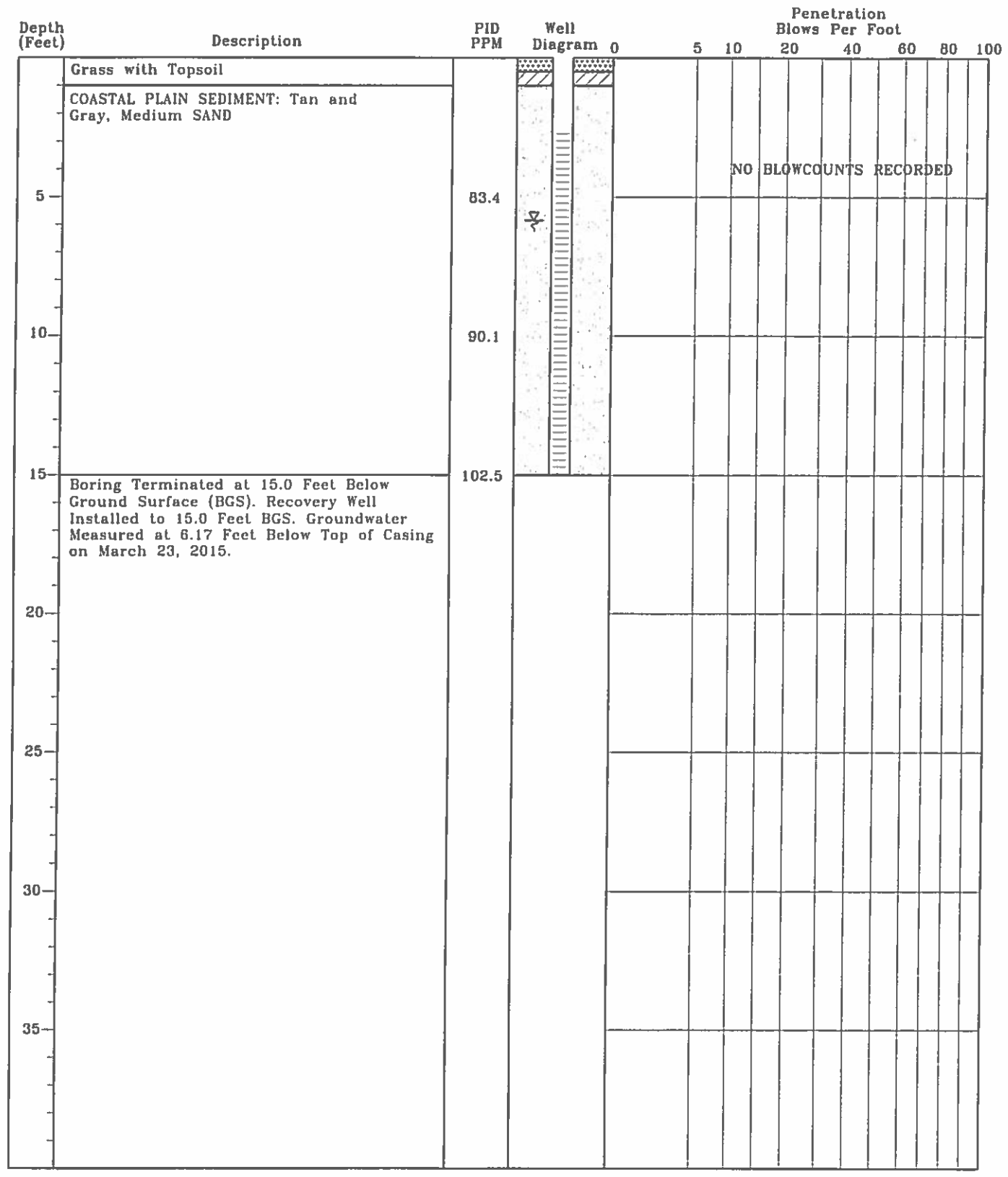
MONITORING WELL INSTALLATION RECORD

Island Car Wash
Hilton Head Island, South Carolina
SCDHEC Site ID# 00990
MECI Project Number 15-5118



Well Number:	RW-3 (00990)
Date Drilled:	03/19/2015
Drilled By:	Environmental Drilling & Pobing Services
Driller: D. Brown	S.C. I.D. #: B 02053
Logged By:	T. Elder

Prepared By:
Midlands Environmental Consultants, Inc.
231 Dooley Road
Lexington, South Carolina 29073
(803) 808-7043 fax: 808-7048



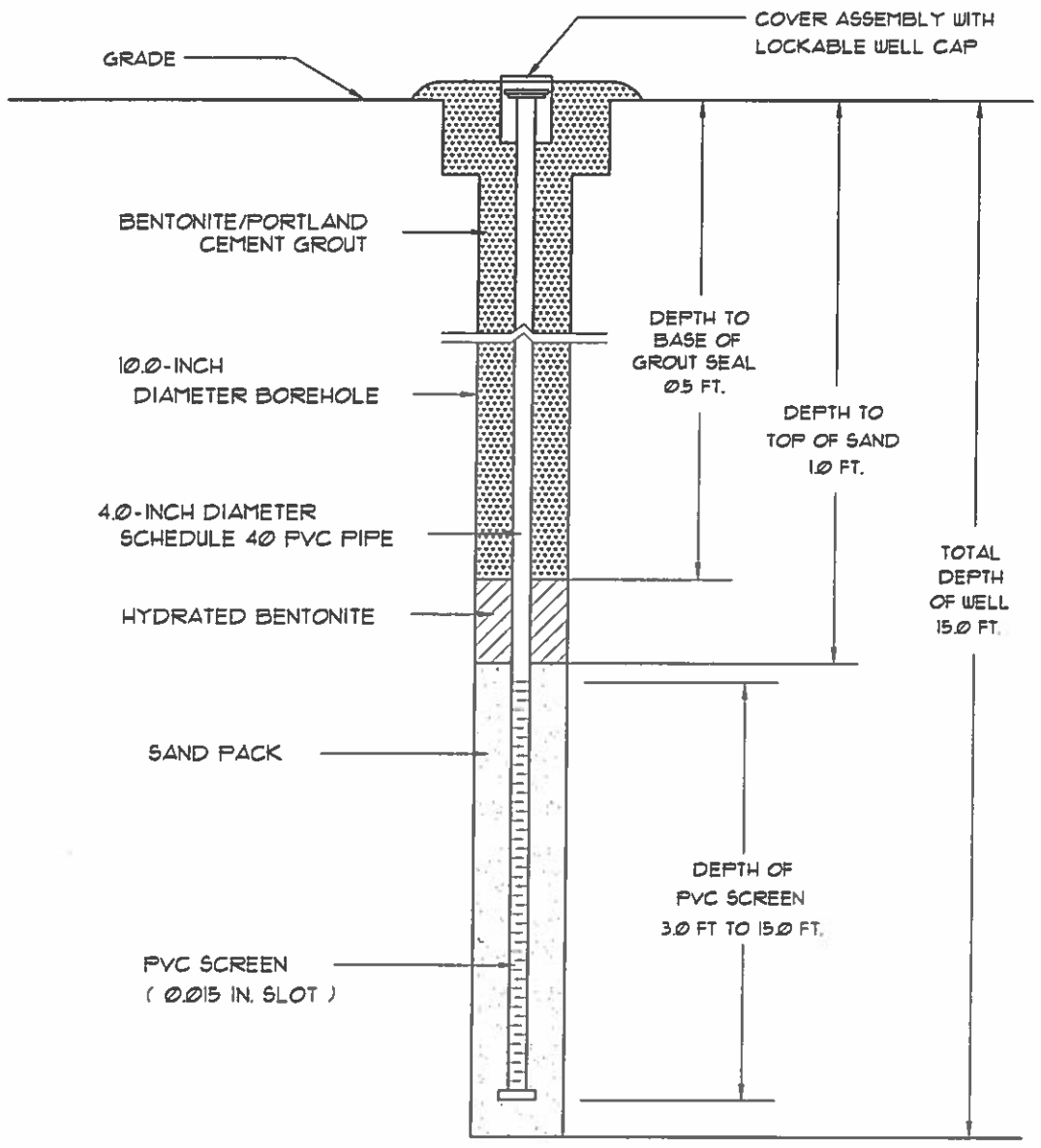
TEST BORING RECORD
Island Car Wash
Hilton Head Island, SC
SCDHEC Site ID# 00990
MECI Project Number 15-5118

Boring Number:	RW-4 (00990)
Date Drilled:	03/19/2015
Drilled By:	Environmental Drilling & Probing Services
Logged By:	T. Elder

Prepared By:
Midlands Environmental Consultants, Inc.
231 Dooley Road
Lexington, South Carolina 29073
(803) 808-2043 fax 808-2048

MONITORING WELL INSTALLATION RECORD

Island Car Wash
Hilton Head Island, South Carolina
SCDHEC Site ID# 00990
MECI Project Number 15-5118



Well Number:	RW-4 (00990)
Date Drilled:	03/19/2015
Drilled By:	Environmental Drilling & Pobing Services
Driller: D. Brown	S.C. I.D. #: B 02053
Logged By:	T. Elder

Prepared By:
Midlands Environmental Consultants, Inc.
231 Dooley Road
Lexington, South Carolina 29073
(803) 808-2043 Fax: 808-2048

D H E C
PROMOTE PROTECT PROSPER

Water Well Record
Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:
Name: SCDHEC (last) (first)
Address: 2600 Bull Street
City: Columbia State: SC Zip: 29201-1708
Telephone: Work: Home:

2. LOCATION OF WELL: COUNTY: Beaufort
Name: Island Car Wash
Street Address: 1008 William Hilton Parkway
City: Hilton Head Island Zip: 29928-3304
Latitude: Longitude:

3. PUBLIC SYSTEM NAME: 00990 **PUBLIC SYSTEM NUMBER:** RW-3

4. ABANDONMENT: ☐ Yes ☑ No
Give Details Below
Grouted Depth: from _____ ft. to _____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
Grass	0.5	0.5
Tan & Gray, SAND*	14.5	15.0
*Indicate Water Bearing Zones (Use a 2nd sheet if needed)		

5. REMARKS:
RW-3

6. TYPE: ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☑ Other

7. PERMIT NUMBER: UMW-25890

8. USE: ☐ Residential ☐ Public Supply ☐ Process ☐ Irrigation ☐ Air Conditioning ☐ Emergency ☐ Test Well ☑ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) 15.0 ft. Date Started: 3/19/2015 Date Completed: 3/19/2015

10. CASING: ☐ Threaded ☐ Welded
Diam.: 4 Inch
Type: ☑ PVC ☐ Galvanized ☐ Steel ☐ Other
0.0 in. to 3.0 ft. depth
_____ in. to _____ ft. depth
Height: Above/Below
Surface _____ ft.
Weight _____ lb./ft.
Drive Shoe? ☐ Yes ☐ No

11. SCREEN:
Type: Schedule 40 PVC Diam.: 2 Inch
Slot/Gauge: 0.015 Length: 12.0 Feet
Set Between: 3.0 ft. and 15.0 ft. NOTE: MULTIPLE SCREENS
_____ ft. and _____ ft. USE SECOND SHEET
Sieve Analysis ☐ Yes (please enclose) ☐ No

12. STATIC WATER LEVEL 6.04 ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
_____ ft. after _____ hrs. Pumping _____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☐ No
Yield: _____

14. WATER QUALITY
Chemical Analysis ☐ Yes ☐ No Bacterial Analysis ☐ Yes ☐ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☑ Yes ☐ No
Installed from 15.0 ft. to 1.0 ft.
Effective size _____ Uniformity Coefficient _____

16. WELL GROUTED? ☑ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☑ Bentonite/Cement ☐ Other _____
Depth: From 0.5 ft. to 0.0 ft.

17. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ ft. ____ direction
Type _____
Well Disinfected ☐ Yes ☐ No Type: _____ Amount: _____

18. PUMP: Date installed: _____ Not installed ☐
Mfr. Name: _____ Model No.: _____
H.P._____ Volts_____ Length of drop pipe_____ ft. Capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

19. WELL DRILLER: David Brown CERT. NO.: 02053
Address: (Print) Level: A B C D (circle one)
17538 Greenhill Road
Charlotte, North Carolina 28278
Telephone No.: 704-807-7529 Fax No.: 803-548-2233

20. WATER WELL DRILLER'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.

Signed: David Brown Well Driller Date: 4/15/2015

If D Level Driller, provide supervising driller's name:

DHEC 1903 (03/2004)

COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER

D H E C
PROMOTE PROTECT PROSPER

Water Well Record
Bureau of Water
2600 Bull Street, Columbia, SC 29201-1708; (803) 898-4300

1. WELL OWNER INFORMATION:
Name: SCDHEC (last) (first)
Address: 2600 Bull Street
City: Columbia State: SC Zip: 29201-1708
Telephone: Work: Home:

2. LOCATION OF WELL: COUNTY: Beaufort
Name: Island Car Wash
Street Address: 1008 William Hilton Parkway
City: Hilton Head Island Zip: 29928-3304
Latitude: Longitude:

3. PUBLIC SYSTEM NAME: 00990 **PUBLIC SYSTEM NUMBER:** RW-4

4. ABANDONMENT: ☐ Yes ☑ No
Give Details Below
Grouted Depth: from _____ ft. to _____ ft.

Formation Description	*Thickness of Stratum	Depth to Bottom of Stratum
Grass	0.5	0.5
Tan & Gray, SAND*	14.5	15.0
*Indicate Water Bearing Zones (Use a 2nd sheet if needed)		

5. REMARKS:
RW-4

6. TYPE: ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☑ Other

7. PERMIT NUMBER: UMW-25890

8. USE:
☐ Residential ☐ Public Supply ☐ Process
☐ Irrigation ☐ Air Conditioning ☐ Emergency
☐ Test Well ☑ Monitor Well ☐ Replacement

9. WELL DEPTH (completed) Date Started: 3/19/2015
15.0 ft. Date Completed: 3/19/2015

10. CASING: ☐ Threaded ☐ Welded
Diam.: 4 Inch
Type: ☑ PVC ☐ Galvanized ☐ Steel ☐ Other
0.0 in. to 3.0 ft. depth
_____ in. to _____ ft. depth
Height: Above/Below Surface _____ ft.
Weight _____ lb./ft.
Drive Shoe? ☐ Yes ☐ No

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Type: Schedule 40 PVC Diam.: 2 Inch
Slot/Gauge: 0.015 Length: 12.0 Feet
Set Between: 3.0 ft. and 15.0 ft. NOTE: MULTIPLE SCREENS
_____ ft. and _____ ft. USE SECOND SHEET
Sieve Analysis ☐ Yes (please enclose) ☐ No

12. STATIC WATER LEVEL 6.17 ft. below land surface after 24 hours

13. PUMPING LEVEL Below Land Surface.
_____ ft. after _____ hrs. Pumping _____ G.P.M.
Pumping Test: ☐ Yes (please enclose) ☐ No
Yield: _____

14. WATER QUALITY
Chemical Analysis ☐ Yes ☐ No Bacterial Analysis ☐ Yes ☐ No
Please enclose lab results.

15. ARTIFICIAL FILTER (filter pack) ☑ Yes ☐ No
Installed from 15.0 ft. to 1.0 ft.
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☐ Neat Cement ☐ Bentonite ☑ Bentonite/Cement ☐ Other _____
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Mfr. Name: _____ Model No.: _____
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TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

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DHEC 1903 (03/2004) COPY 1 MAIL TO SCDHEC, COPY 2 TO WELL OWNER, COPY 3 TO WELL DRILLER